Stat. 316: Statistics and Probability for Science and Engineering

Department of Statistics and Biostatistics, CSU East Bay

Prof. Eric A. Suess

2024-01-17

Fall 2024

Course Description:

Basic probability rules (independence, Bayes' Theorem), distributions (binomial, Poisson, normal, exponential), reliability. Descriptive, inferential statistics (control charts, estimation, hypothesis testing: one, two samples), correlation, regression. Emphasizes: computer analysis, simulation; science, engineering applications.

Lecture:

- Section 4: M 2:00 - 3:15 online Zoom, W 2:00 - 3:15 SSc 204

Instructor: Prof. Eric A. Suess

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Office Hours:

- W 10:45-11:45 in NSc319
- Th 10 to 11am by Zoom, https://csueb.zoom.us/j/88355404471
- or by appointment

Class Website: All class materials will be posted on Canvas.

Required Texts:

- Darrin Speegle, Bryan Clair, Probability, Statistics, and Data: A Fresh Approach Using R, 1st Edition, Chapman & Hall/CRC Texts in Statistical Science, 2023.

Reference Texts:

- Wickham, Cetinkaya-Rundel, R for Data Science, 2e, O'Reilly, 2023.

- Kim, McConville, ModernDive: Statistical Inference via Data Science, A ModernDive into R and the Tidyverse, 2023.
- Hayter, Probability and Statistics, For Engineers and Scientists, 4th Edition, Cengage, 2013.

Technical Requirements:

Access to a modern computer and permission to install software, R and RStudio. Access to the internet.

Material To Be Covered:

In this course you will learn about the application of Probability Theory and Statistical Inference used in Engineering and Computer Science. The main course objectives will be to introduce the fundamentals of probability, give examples of discrete and continuous random variables, and present the basic ideas of sampling, estimation, confidence intervals, and hypothesis testing thought the use of computer software. Part of the course will be devoted the use of R programming language to demonstrate and implement the mathematical ideas presented.

Homework:

Homework will be assigned weekly. Homework will be "due" on Mondays, which means you should complete the homework and come to class prepared to ask questions. Homework will be "collected" though Canvas and needs to be submitted by Friday of the week the homework is due.

Quizzes and Exams:

Two or three short quizzes, two midterm will be given and the final. You are expected to bring a calculator with you to all exams and your Student I.D. for identification.

Grading: >= 90% A, >= 80% B, >= 70 C, >= 60% D, <60% F

- Homework 10% (each homework is equally weighted regardless of total points)
- Quizzes 5% (each quiz is equally weighted regardless of total points)
- Midterm I 25%
- Midterm II 25%
- Project 10%
- Final 25%

Policy on Make-up Exams:

You are expected to take the quizzes and exams at the scheduled times. In case of genuine emergency, illness or hardship, for which you can present written documentation I may agree to arrange for a make-up exam. Make-up exams must always be arranged BEFORE the regular exam is given and always take place AFTER the regular exam. Quizzes may not be made up!

Statistics 316 SLOs

Student Learning Outcomes (SLO's):

Students graduating with an B.S. in Statistics from Cal State East Bay will be able to:

1. Apply basic computational skill in descriptive statistics and graphical displays; hypothesis testing and confidence intervals; modeling and error analysis.
2. Communicate to others results involving descriptive statistics and graphical displays; hypothesis testing and confidence intervals; modeling and error analysis.
3. Analyze data using appropriate statistical computer software and to interpret the results covering descriptive statistics and graphical displays; hypothesis testing and confidence intervals; modeling and error analysis.